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QUALCOMM INCORPORATED			VUONG, QUOCHIEN B	
5775 MOREHOUSE DR.			ART UNIT	PAPER NUMBER
SAN DIEGO, CA 92121			2618	
			NOTIFICATION DATE	DELIVERY MODE
			02/04/2009	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/624,247	SAHOTA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Quochien B. Vuong	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 17 January 2008.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-37 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-13,15-18,21-29 and 32-37 is/are rejected.  
 7) Claim(s) 14,19,20,30 and 31 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/21/07</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____ .                        |

## DETAILED ACTION

### ***Claim Objections***

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claim 35 (the second one) has been renumbered 36.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 35 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 36 recites “wherein the reference signal is fixed and independent of supply voltage for the interface circuit” which does not have any support from the specification.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 7-13, 15-17, 22-28, and 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lippmann et al. (US 5,371,500) in view of Cook (US 4,894,864).

Regarding claim 1, Lippmann et al. disclose a device (figure 1) comprising: an interface circuit formed on a first integrated circuit (IC) (30) for generating a signal responsive to a reference signal (26, 28) and to a digital data input (32); and a circuit element (36) formed external of the first IC for generating an output signal on the basis of the signal from the first IC (column 2, line 32- column 3, line 26, and figure 1). Lippmann et al. do not specifically teach the signal from the first IC is a differential

current signal. However, it is well known in the art for generating a differential current signal responsive to a reference signal and to a digital data input as taught by Cook (column 2, line 48 - column 3, line 13, and figure 1). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the teaching of Cook for generating the differential current signal to the device of Lippmann et al. for providing an alternate signal form which serving the same function as providing the output signal from the input and reference signals.

Regarding claims 2, 3 and 8, Lippmann et al. and Cook do not disclose the device is a quadrature transmitter or a CDMA telephone. However, examiner takes Official notice that a quadrature transmitter or CDMA telephone is well known in the art. Therefore, it would have been obvious to adapt the device of Lippmann et al. and Cook to the well known quadrature transmitter or CDMA telephone for converting the signal from digital to analog and vice versa, and providing the compact design to the quadrature transmitter or CDMA telephone.

Regarding claim 4, Lippmann et al. disclose the reference signal is generated by a reference circuit on a second IC or coupled to the second IC (see figure 1).

Regarding claim 5, Lippmann et al. (figure 1) disclose a reference circuit (16) for generating the reference signal.

Regarding claim 7, Lippmann et al. and Cook do not disclose the differential current signal is at least one of an inphase (I) and a quadrature (Q) baseband signal. However, examiner takes Official notice that a differential current signal having at least one of an inphase and a quadrature baseband signal is well known in the art. Therefore,

it would have been obvious to adapt the well known digital data input having at least one of an ' inphase and a quadrature baseband signal to the device of Lippmann et al. and Cook for processing baseband signal in a communication equipment.

Regarding claims 9 and 10, Lippmann et al. disclose the reference signal is a voltage related to a bandgap voltage (column 7, lines 29-36, and figure 9). Regarding claims 11-13, if not inherent it would be obvious for the output signal of the device of Lippmann et al. and Cook is a current signal since the output signal is generated based on the different current signal," and alternately be a voltage signal by a simple current/voltage conversion and for the resistor is external to the first and second ICs or is incorporated onto the second IC depending on the design preference to reducing the manufacture cost and for compact design.

Regarding claims 15 and 16, since the first IC of Lippmann et al. is a digital circuitry, therefore, it would have been Obvious for the data input comprises at least four bit digital data signal or an oversampled digital data signal to get a more accuracy of signal conversion.

Regarding claim 17, Cook disclose the circuit element is a variable gain amplifier (VGA) (column 2, lines 24-25, and figure 1).

Regarding claim 22, Lippmann et al. disclose ananalog circuit (IC) (figure 1) adapted for use in a communication device, and responsive to an input signal generated externally as a function of a reference signal and a digital data input, the analog IC being coupled to a reference circuit for generating the reference signal, and comprising a circuit element for generating an output signal on the basis of the differential current

signal (column 2, line 32- column 3, line 26, and figure 1). Although Lippmann et al. do not specifically teach the input signal is a differential current input signal. However, it is well known in the art for generating a differential current input signal responsive to a reference signal as taught by Cook (column 2, line 48 - column 3, line 13, and figure 1 ). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the teaching of Cook for generating the differential current signal to the IC of Lippmann et al. for providing an alternate signal form which serving the same function as providing the comparison result between the input and reference signals.

Regarding claims 23 and 24, Lippmann et al. disclose the reference signal is a voltage related to a bandgap voltage (column 7, lines 29-36, and figure 9).

Regarding claims 25-27, if not inherent it would be obvious for the reference signal of the IC of Lippmann et al. and Cook is a current signal Since the input different current signal is a function of the reference signal signal, and the output can be either current or voltage signal by a simple current/voltage conversion and for the resistor is external to the analog IC or incorporated onto the analog IC depending on the design preference to reducing the manufacture cost and for compact design.

Regarding claim 28, Cook discloses the IC is a variable gain amplifier (VGA) (column 2, lines 24-25, and figure 1).

Regarding claim 33, Lippmann et al. disclose a device (figure 1) comprising: an interface circuit formed on a first integrated circuit (IC) (30) for generating a signal

responsive to a digital data input comprising multiple bits (32); and a circuit element (36) formed external of the first IC for generating an output signal on the basis of the signal from the first IC (column 2, line 32- column 3, line 26, and figure 1 ).

Lippmann et al. do not specifically teach the signal from the first IC is a differential signal. However, it is well known in the art for generating a differential signal responsive to a reference signal and to a digital data input as taught by Cook (column 2, line 48 - column 3, line 13, and figure 1). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the teaching of Cook for generating the differential current signal to the device of Lippmann et al. for providing an alternate signal form which serving the same function as providing the output signal from the digital data input.

Regarding claim 34, Lippmann et al. and Cook disclose the device of claim 33 above. In addition, Cook discloses the differential signal is a differential current signal (column 2, line 48 - column 3, line 13, and figure 1).

Regarding claim 35, Lippmann et al. and Cook disclose the device of claim 33 above. In addition, Lippmann et al. disclose the interface circuit generates the differential signal responsive further to a reference signal (26 and 28, see figure 1).

Regarding claim 36, (in view of the 112, 1st paragraph rejection above, the claim is interpreted as best understood by the examiner), Lippmann et al. disclose the reference signal (26, 28) for the interface circuit (figure 1).

Regarding claim 37, Lippmann et al. disclose the circuit element is formed on a second IC (see figure 1).

Regarding claim 5, Lippmann et al. (figure 1) disclose a reference circuit (16) for generating the reference signal.

Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lippmann et al. in view of Cook and further in view of Rosch et al. (us 5,274,702)

Regarding claim 6, the combination of Lippmann et al. and Cook discloses the circuitry as in claims 1-3. Lippmann et al. and Cook do not specifically disclose at least one capacitor coupled between the differential current signal. However, it is well known in the art that a differential current signal is coupled to at least capacitor as taught by Rosch et al. (column 9, lines 59-63, and figure 3). Therefore, it would have been obvious for one having ordinary skill in the art to adapt the capacitor of Rosch et al to the different current signal of Lippmann et al. and Cook for providing a transmit signal.

Claims 18, 21,29, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lippmann et al. in view of Cook and further in view of Nakamura et al. (US 4,573,153).

Regarding claims 18 and 29, Lippmann et al. and Cook fail to disclose the circuit element is a modulator. However, Nakamura et al. teach a modulator as a circuit element (column 2, lines 16-40, and figure 1). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the modulator of Nakamura et al. to the circuitry of Lippmann et al. and Cook for compensating data error.

Regarding claims 21 and 32, Lippmann et al., Cook, and Nakamura do not disclose the modulator performs direct up conversion. However, the examiner takes Official notice that it is well known in the art for a modulator to perform direct up conversion. Therefore, it would have been obvious to adapt the well known modulator to perform direct up conversion to the device of Lippmann et al., Cook, and Nakamura for compact design in up conversion circuitry.

***Allowable Subject Matter***

Claims 14, 19, 20, 30, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

Applicant's arguments filed 01/17/2008 have been fully considered but they are not persuasive.

Regarding claim 1, Applicant argues that Lippmann and Cook do not disclose "an interface circuit formed on a first integrated circuit (IC) for generating a differential current signal responsive to a reference signal and a digital signal". The examiner, however, does not agree with the Applicant. Applicant's attention is directed to Lippmann (column 2, line 32- column 3, line 26, and figure 1) which clearly disclose an interface circuit formed on a first integrated circuit (IC) for generating a signal responsive to a reference signal and a digital signal and Cook (column 2, line 48 -

column 3, line 13, and figure 1) generating a differential current signal responsive to a reference signal and a digital signal. Lippmann further disclose a circuit element (36) formed external of the first IC for generating an output signal on the basis of the signal from the first IC (see figure 1).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both Lippmann and Cook disclose the interface circuit between digital circuitry and analog circuitry (see figure1 of Lippmann and Cook). And the motivation for combine these references is providing an alternate signal form which serving the same function as providing the output signal from the input and reference signals.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quochien B. Vuong whose telephone number is (571) 272-7902. The examiner can normally be reached on M-F 9:30-18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quochien B Vuong/  
Primary Examiner, Art Unit 2618